Quality Systems Manual
Materials Division

Section 4 -- Testing and Recording

Laboratory Tests

Asphalt Laboratory

The following tests are performed in the Asphalt Laboratory:

Name of Test	Reference (ASTM, AASHTO, or UDOT #)	Frequency (# per month or year)
Absolute Viscosity	AASHTO T-202	260 per month
Kinematic Viscosity	AASHTO T-201	100 per month
Saybolt Viscosity	AASHTO T-27	16 per month
Brookfield Viscosity	AASHTO MP 1	60 per month
Penetration	AASHTO T-49	120 per month
Softening Point	AASHTO T-53	20 per month
Ductility	AASHTO T-51	120 per month
Toughness - Tenacity		40 per month
Distillation - Emulsion	AASHTO T-59	4 per month
Distillation - Cutback	AASHTO T-78	4 per month
Flash and Fire Points	AASHTO T-48	1 per month
Solubility	AASHTO T-44	1 per month
Cement Mixing	AASHTO T-59	4 per month
Dynamic Shear Rheo.	AASHTO T-315	180 per month
Bending Beam Rheo.	AASHTO T-313	72 per month
Partical Charge	AASHTO T-59	5 per month
Demulsibility	AASHTO T-59	4 per month
Flash Point-Tag Open-Cup	AASHTO T-79	
Asphalt Viscosity-Brookfield	ASTM D 4402	
Specific Gravity-Semi-Solid Bituminuous Materials	AASHTO T-228	
Rolling Thin-Film Oven Test	AASHTO T-240	
Direct Tension Test	AASHTO T-314	180 per month
Rotational Viscosity Test	AASHTO T-316	180 per month

Bituminous Laboratory

The following tests are performed in the Bituminous Laboratory:

Name of Test	Reference (ASTM, AASHTO, or UDOT #)	Frequency (# per month or year)
Quantitative Extraction of Bitumen	AASHTO T-164 E	50 per month
Recovery of Asphalt (Abson)	AASHTO T-170	50 per month
Loaded Wheel Tester	APA	20 per month
Field Marshall - 3 briq.	UDOT 8-942	8/month (Summer)
Resistance to Plastic Flow - Marshall	AASHTO T-245	0-1 per year
Measured Maximum Density - Rice	AASHTO T-209	30 per month
Lottman Test	AASHTO T-283	0-1 per year
Washed Gradations After Extraction	AASHTO T-30	10 per month
Sieve Analysis for Coarse and Fine Agg.	AASHTO T-27	5 per month
Sieving & Batching Agg.	UDOT 8-941	100 hours per month
Thermal Expansion	UDOT	0-1 per year
Core Density	AASHTO T-166	20 per month
Asphalt Retention Test	UDOT	1 per year
Plant Mix Seal - Bonding & Complete	UDOT	0-1 per year
Hamburg Wheel Tracker	UDOT	30 per month
APA Fatigue Test		15 per month
Ignition Oven Test	AASHTO T-308	20 per month
Gyratory Compaction	AASHTO T-312	30 per month
Carlok (SPG)	UDOT	40 per month
Vacuum Extraction	AASHTO T-164	5 per month
Abson Recovery	AASHTO T-170	5 per month
Dynamic Angle Validator (Internal Angle Gyratory)	UDOT	50 per year

Cement Laboratory

The following tests are conducted in the Cement Laboratory:

ASTM C151	Autoclave Expansion of Portland Cement
ASTM C183	Practice for Sampling and the Amount of Testing of Hydraulic Cement
ASTM C219	Standard Terminology Relating to Hydraulic Cement
ASTM C230	Specification for Flow Table for Use in Tests of Hydraulic Cement
ASTM C305	Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
ASTM C511	Specification for Moist Cabinets, Moist Rooms and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
ASTM C778	Specification for Standard Sand
ASTM C1005	Specification for Weights and Weighing Devices for Use in Physical Testing of Hydraulic Cements
ASTM C150	Standard Specification for Portland Cement
ASTM C185	Method for Aid Content of Hydraulic Cement Mortar
ASTM C187	Standard Test Method For Normal Consistency of Hydraulic Cement
ASTM C188	Standard Test Method for Density of Hydraulic Cement
ASTM C191	Test Method for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C204	Test Method for Fineness of Portland Cement by Air Permeability Apparatus
ASTM C490	Practice for Use of Apparatus for the Determination of Length Change of Hardened Cement Paste, Mortar, and Concrete
ASTM D1193	Specification for Reagent Water
ASTM C430	Standard Test Method For Fineness of Hydraulic Cement by the Micron (no.325) sieve
ASTM C593	Standard Specification for Fly Ash and Other Pozzolans For Use With Lime
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C311	Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans For use as a Mineral Admixture in Portland-Cement Concrete
ASTM C266	Test Method for Time of Setting of Hydraulic Cement Past by Gillmore Needles
ASTM C618	Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM E18	Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM C1038	Standard Test Method for Expansion of Portland Cement Mortar Bars Stored in Water
ASTM C1222	Standard Practice for Evaluation of Laboratories Testing Hydraulic Cement

ASTM Volume 04.01	Cement; Lime; Gypsum; Section 4 (Manual of Cement Testing)
ASTM E337-84	(1990) Measuring Humidity with a Psychrometer (Measuring Wet-bulb and Dry-bulb Temperatures) (See vol. 11.03)
ASTM E1	Standard Specification for Thermometers
ASTM E77	Standard Test Method for Inspection and Verification of Thermometers
ASTM E1502	Standard Guide for Use of Freezing-Point Cells for Reference Temperatures

Chemistry Laboratory

The following tests are performed in the Chemistry Laboratory:

Chemical Test	Method	Frequency
Epoxy Paint - Amine	ASTM D2074	1 per month
Epoxy Point - Epoxide content	ASTM D1652	2 per month
Portland Cement Analysis	ASTM C114	20 per month
Lime - Chemical Analysis & Gradation	AASHTO T-219	30 per month
Road Salt - Gradation	ASTM C135	3 per year
Road Salt - YPS, MgCl.6H2O	State	3 per year
Road Salt - NaCl, H2O	ASTM E534	3 per year
Concrete Water - pH and Salt Content	AASHTO T-26	1 per year
pH - water or soil	ASTM D1293	1 per month
Concrete Water CaO	AASHTO T-26	
Organic Materials - Soils	AASHTO T-194	1 per month
Pigment in Paints (Lead, Silico Chromate)	ASTM D3335	6 per year
Potential Reactivity of Aggregates	ASTM C289	10 per year
Chloride Determination - Concrete	ASTM C1152	40 per year
Soluble Salts - Soils	State 8-943	6 per year
Chloride in Soils	ASTM D1411	
Sodium in Soils	State	
Sulfate in Soils and Aggregate	State	1 per month
Sulfate in Water	ASTM D516	
Toxicity Characteristic Leaching Procedure	USEPA SW 846 Method 1311	5 per year
Concrete Core Prep - Cl Determination	ASTM C1152	40 per year
Insoluble Residue in Carbonate Aggregate	ASTM D3042	
Fly Ash - Moisture Content	ASTM C311	20 per year
Fly Ash - Loss on Ignition	ASTM C311	20 per year
Fly Ash - SiO2, Al203, Fe203	ASTM C311	20 per year
Fly Ash - S03	ASTM C311	20 per year
Fly Ash - MgO	ASTM C311	20 per year
Fly Ash - Available Alkalies	ASTM C311	20 per year
Zinc - Chemical Analysis	ASTM E536	3 per month
Coating Weight - galvanized wire	ASMT A90	2 per month
Ash Content - Pipe coating	ASTM D146	1 per month
Acid and Alkali Resistance		

Geotechnical Division

The following tests are performed by the Geotechnical Division:

Name of Test	Reference (ASTM, AASHTO or UDOT #)	Frequency (# per month or year)
Sample Preparation.	AASHTO T-87	20 per month
Particle Size Analysis	AASHTO T-88	20 per month
Liquid Limit	AASHTO T-89	20 per month
Plastic Limit	AASHTO T-90	20 per month
Shrinkage Factors	AASHTO T-92	2 per year
Standarad Proctor	AASHTO T-99	10 per year
Specific Gravity	AASHTO T-100	10 per month
Sand Equivalent	AASHTO T-176	10 per year
Modified Proctor	AASHTO T-180	2 per year
California Bearing Ratio	AASHTO T-193	2 per year
Unconfined Comp. Strength	AASHTO T-208	5 per month
Permeability (Granular)	AASHTO T-215	2 per year
Consolidation	AASHTO T-216	10 per month
Direct Shear	AASHTO T-236	5 per month
Moisture Content	AASHTO T-265	20 per month
Triaxial Shear	ASTM D2850	1 per month
Finer than No. 200	AASHTO T-11	20 per month
Unit Weight	AASHTO T-19	10 per year
Organic Impurities	AASHTO T-21	10 per year
Sieve Analysis	AASHTO T-27	10 per year
Sp. Gr.-Absorb. of Fines	AASHTO T-84	10 per year
Sp. Gr.-Absorb. of course	AASHTO T-85	10 per year
Soundness	AASHTO T-104	10 per year
Clay lumps/Friable	AASHTO T-112	10 per year
Field Reduction of Samples	AASHTO T-248	2 per year
Moisture Content of Agg.	AASHTO T-255	2 per year

Paint/Pavement Marking Laboratory

The following tests are performed in the Paint/Pavement Marking Laboratory:

Name of Test	Reference	Frequency
Solvent-Based Paint		
Pigment Content of Coatings	ASTM D-2371, ASTM D-3723	5 per month
Volitile Content of Coatings	ASTM D-2369, FTMS 4053	5 per month
Density Paint, Varnish, Lacquer and Related Products	ASTM D-1475	15 per month
Volitile Content of Coatings	ASTM D-2369	5 per month
Consistency of Paints using the Stormer Viscometer	ASTM D-562	15 per month
Drying, curing, or film formation of organic (FTMS 4061) Coatings at room temperature	ASTM D-1640	1 per month
Drying, curing, or film formation of organic (FTMS 4061) Coatings at room temperature	ASTM D-1640	15 per month
Drying, curing, or film formation of organic (FTMS 4061) Coatings at room temperature	ASTM D-1640	15 per month
Volitile Organic Compound (VOC) Content	ASTM D-3960	20 per year
Epoxy Traffic Paint		
No-Pick-Up Time of Traffic Paint	ASTM-711	15 per year
Tensile Properties of Plastics	ASTM D-638	15/set of five per year
Compressive Properties of Rigid Plastic	ASTM D-695	15/set of five per year
Rubber Property Durometer Hardness	ASTM D-2240	15/set of three per yr.
Adhesion to Concrete	ACI Method 503	when needed
Operating Light and Water Exposure Apparatus for Exposure of Nonmetallic Materials	ASTM G-53	15/set of three per yr
Yellowness Index of Plastics	ASTM D-1925	15/set of three per yr
Abrasion Resistance of Organic Coatings by the Taber Abaser	ASTM D-4060	15/set of five per year

E-1347 Test Method for Directional Reflectance Factor	ASTM E-97	15/set of three per yr
Epoxy Content of Epoxy Resins	ASTM D-1652	15 per year
Acid Value and Amine Value of Fatty Quaternary Amine	ASTM D-2076	15 per year
Glass Spheres		
Sieve Analysis of Glass Spheres	ASTM D-1214-58	200 per year
Sieves (calibration)	ASTM E-11-61	1 per year
Pavement Marking Tape		
Retroreflectance of Horizontal Coatings	ASTM D-4061	1500 per year
Rubber Property-Change in Length During Liquid Immersion	ASTM D-1460	30 per year
Tensile Properties of Plastics	ASTM D-638	0-10 per year
Rubber from Natural Sources - Plasticity Retention	ASTM D-3194	0-10 per year
Measuring Surface Frictional Properties Using the British Pendulum Tester	ASTM E-303	0-10 per year

Quality Assurance Section

The following tests are performed by the Quality Assurance Section:

Name of Test	**Reference** (ASTM, AASHTO, or UDOT #)	**Frequency** (# per month or year)
Unit Weight	AASHTO-T19	12 month
Slump Cone	AASHTO-T119	12 month
Compressive Test	AASHTO 67-85	12 month
Air Meter	AASHTO T152-82	3 month verification & 12 month calibration
Moist Cabinet	ASTM C511-93	12 month
Concrete Molds	AASHTO M205-90	per lot
Balance	In House	12 month
Concrete Cap Cyl.	AASHTO T-22-92	3 month verification & 12 month calibration

Procedures for Sample Processing

Asphalt Laboratory

Receiving and Processing Incoming Samples

< The asphalt is first sampled in accordance with applicable ASTM and AASHTO procedures and as outlined in our Minimum Sampling Requirements.
< Samples are then submitted to the Material Division's Asphalt Laboratory.
< Each sample is assigned a unique sample number which remains with the sample throughout the testing process.
< All samples are retained until the test results are reviewed and the Laboratory Engineer signs off on them.

Disposal of asphalt samples

< Liquid asphalts (cut-back and emulsions) are collected and returned to a local refinery for recycling.
< Semi-solid asphalt cement samples are disposed of in the trash dumpster.

Recording and filing

< After the sample is received according to the procedure outlined in this section, it is logged into our laboratory computerized data base by:
    < Sample number
    < Project number
    < Charge Identification number
    < Project Engineer
    < Type and grade of asphalt

< Initial test results are recorded on memo pads which are kept on file in the asphalt laboratory files, and the information is entered into our computerized data base.
< Each project is submitted monthly on an updated print-out of testing activity.
< A formal test report is submitted to the Project Engineer only if the sample fails a test.

Bituminous Laboratory

Receiving Samples

< Samples are processed in accordance with applicable ASTM procedures.
< The R-247 form is completed with an ID number for each sample after the material has been processed. This identification form remains with the sample throughout the testing process.
< Whenever the material is divided, a duplicate form is enclosed with all sections of the original sample.

Processing Incoming Samples

< Sample are prepared for testing and tested.
< Test results are entered into a pre-programmed computer format to be printed as a report and reviewed.
< If all information is satisfactory, the report is the copied, filed, distributed, and mailed.
< All samples are retained for two weeks after the Laboratory supervisor has reviewed the test results and signed off on them.

Disposal of bulk samples

< Non-hazardous samples are classified are disposed of in the trash dumpster.
< Hazardous samples are disposed of through our Safety Loss Control Unit who supervises disposal through EOG Environmental.

Cement Laboratory

Receiving and Identifying

< Sample is received/sieved through a number 20 sieve.
< Label two number 20 cans as follows, and give one to the Chemistry Laboratory.
Assign a sample number - the current date plus 10-2.
Identify and note the type of cement and designation (Ashgrove becomes 1-2-3-5).
Assign plant number from P1 to P13. P1 is Limington cement plant in Delta.

Processing samples

< Use 10 lb minimum (4540 grams) of cement to make a set of cubes (6 cube mix).
Make a normal consistency test
Make a time set
Make Autoclave bars
< Remove cubes from molds, mark them, and place in the moisture cabinet.
< Run the Autoclave procedure.
< Determine the air permeability (fineness).
< Break cubes on the third and seventh days using the press in the Physical Testing Laboratory.
< Record the results on a work sheet and a test report form.
< Complete a test report heading and report all data of the samples being tested.
< Place the completed test report forms in the Phil Davis box.

FlyAsh Sample Procedure

< Identify and label the sample. Complete test report form header.
< Run a specific gravity test on a sample.
< Calculate the amount of flyash to be used in making the sample.
< Make a sample using a type one cement and run a flow test.
< Make a control sample and record the flow and amount of water used.

< Make a set of three cubes. (Three cubes is one test.)
< The next day, take all cubes and mark them for seven and twenty-eight day breaks.
< (One control test for the day #7, and one control test for the day #28 for the same sample being tested)
< Record the results in the Green Book and the test report form.
< Remove the cubes from the molds and place in ½ gallon cans. Put lids on the cans and secure tightly. Form an air-tight seal aroung the top of the lid with melted wax.
< Mark the top and side of each can with the sample number, dates the sample was made, and dates the sample was broken.
< Place the sealed cans into the environmental laboratory ovens at 100EF.
< On the appropriate date, remove the cans from the oven, take the samples from the cans,

break the samples.
Record the results.
Run the sample through the 325 sieve and record the results on the test report.
File the completed test report in the Phil Davis box.

Disposal of Test Materials

1. Cement is placed in containers which are placed in a dumpster for removal.
2. Waste sand and cement are collected in a settling bin and placed in a plastic bag. The plastic bag is sealed and placed in a dumpster for removal.
3. All other waste is disposed of in the laboratory sink which is connected to a large chemical pit.
4. Paper waste materials are placed in plastic buckets which are emptied into waste containers.
5. 2" X 2" test sample cubes are place in the dumpster for removal after testing is completed.
6. Autoclave bars and time set patties are placed in the dumpster for removal.
7. Kerosene is decanted from the flyash and filtered with a buchner apparatus. It is then placed into a 55 gallon barrel, and the plyash is placed in the dumpster for removal.
8. Acids are flushed into the chemical pit connected to the laboratory sink after it has been used to clean items such as molds and glassware.

Certification Laboratory

Receiving

When new equipment is purchased for any Materials Division field Laboratory, regional Laboratory, or the headquarters central Laboratory it is shipped to the Receiving Dock in the Materials Testing Facility (MTF) building at the Utah Department of Transportation/Department of Public Safety (UDOT/DPS) main complex (4501 South 2700 West, Salt Lake City, Utah, 84119).

Processing

1. New equipment is taken to the Certification Laboratory (in the MTF building) where the equipment's destination within the state system is determined from equipment documentation, using purchase order numbers, etc.
2. It is given a superficial inspection for damage or missing accessories.
3. If it passes these first tests, the equipment will be tested to see that it operates as expected.
4. If necessary, the equipment may also be tested to see that it meets expected calibration parameters.
1. UDOT personnel record pertinent information such as serial numbers, and model numbers when they are satisfied with the results of these tests .
2. This information is sent to the Project Development Support Services Division where it is recorded in the State's inventory, and a unique inventory number is assigned.
3. A sticker with the inventory number is placed in a visible location on the equipment.
4. Documentation, including operation manuals, is photocopied for Certification Laboratory files.
5. The equipment is transported to where it will be used.

< Equipment that is presently being used for testing by the Central Laboratories is certified at the interval of required calibration.
< Each lab informs the Certification Lab of approaching calibration period and schedules the certification of their individual equipment.
< Repairable equipment returned to the Certification Lab for renovation is kept inside until repairs and re-calibration are made. This may be accomplished by Certification Lab personnel.
< The equipment is then returned to service.

Repair and re-calibration may also be performed by local contractors outside of UDOT. For example, UDOT currently has a contract with Air Meter Services for refurbishing and re-calibrating of air meters; re-calibration takes place annually, but may be done more often if needed. The existence of the contract appears to save the State time and money. However, the contract does not preclude the repairs and re-calibration by UDOT personnel at the region level currently taking place at the discretion of the region(s) involved. As another example, scales and

balances have been repaired by the Certification Lab. At present, repair and re-calibration are also presently being done by outside local contractor(s).

Certification lab, page 2

Disposal

< Equipment removed from service as a result of obsolescence or poor performance is presently retained in cold storage outside of the MTF building until such time as its disposition has been determined.

< Such equipment usually becomes slated as surplus property, able to be "traded in" on the purchase of new equipment.

< If the vendor to whom it was traded decides not to retrieve the equipment, UDOT will destroy the equipment for the vendor.

Chemistry Laboratory

Receiving Samples

1. Samples are assigned a unique number according to the procedures in "Preparing Sample Log."

2. Samples are kept on the sample receiving table until testing is completed.

3. Samples are retained until two weeks after the report is submitted.

Disposing of Samples

1. Non-hazardous samples (i.e. cement and live samples) are disposed on in the trash dumpster.

2. Hazardous aqueous and organic wastes are retained in storage containers and sent to a hazardous waste facility.

Geotechnical Division (Soil)
Processing of Soil Samples

Identification
- Each sample has a sample tag which identifies the project, the location, the bore hole number, depth, and sample number.
- The sample tag is kept with the sample as long as it remains in the soils laboratory.

Storage
- The samples are logged in by the field geologist.
- After being logged in, SPT and other disturbed samples are stored on the "active testing" table. Tube samples are stored upright in the frames adjacent to the table.
- The samples remain at this location until the required testing is completed.
- Care is taken to avoid disturbance or contamination.

Retention
The samples are stored on the shelves adjacent to the "active testing" table when testing is satisfactorily completed.

Disposal
- Disposal of samples occurs only after the geotechnical engineer in charge of the project authorizes it.
- Samples of non-hazardous materials are transported to the dumpster outside the laboratory.
- Samples containing hazardous materials are not handled by the soils laboratory.

Geotechnical Division (Aggregate)
Processing of Aggregate Samples

Identification

Each sample has a sample tag indicating the sample number. The tag identifies the material by

- the project
- the location of use within the project
- the quantity of the material represented by the sample
- the material's intended use

The sample tag remains with the sample as long as it is in the aggregate laboratory.

Storage

- The samples are logged in by the laboratory technician in charge of aggregate testing.
- They are then kept in the storage area of the aggregate laboratory until the required testing is completed.
- Any disturbance or contamination of the samples is carefully avoided.

Retention

- Samples with acceptable test results are generally discarded when testing is completed.
- Samples with failing test results are retained until the results are reviewed, and a decision is made whether to discard, retest, or retain the sample.

Disposal

- Discarded samples of non-hazardous materials are transported to the dumpster outside the laboratory.
- Samples containing hazardous materials are not handled in the aggregate laboratory.

Paint/Pavement Marking Laboratory

Identification

Each sample is assigned identification indicating

Lot number
Manufacturer
Material type

Storage

1. Samples are logged in by the technician.
2. Samples are stored on the "active testing" counter. Samples remain at this location until the rquired testing is completed. Contamination and disturbance of the sample is carefully avoided.

Retention

Samples are retained for one month on the counter adjacent to the "active testing" counter.

Disposal

1. Solvent-based samples are poured into five gallon containers and are given to region paint crews to flush through their trucks.
2. Non-hazardous materials are transported to the dumpster outside the laboratory.
3. Samples containing hazardous materials are accumulated and sent to the hazardous materials shed and stored in 55 gallon drums before they are transported to an appropriate disposal site.

Quality Assurance Section

Receiving Incoming Samples of Pozzolans and Cements

< Form R-828 is completed and attached to the material after it is sampled in accordance with applicable ASTM procedures. This identification tag remains with each sample throughout the testing process.
< Whenever the material is divided, a duplicate tag is enclosed with all portions of the original sample.
< All samples are retained until the test results are reviewed.
< If previous arrangements are made with the purchaser, instructions from the purchaser supersede standard operating practices.

Processing Incoming Samples

< Samples are next delivered to the appropriate lab for testing.
< After testing is completed, the data processor enters information from the test worksheet into the computer on a pre-programmed format.
< A report is printed, reviewed for accuracy, copied, filed, distributed and mailed.

Disposal

< Non-hazardous samples are disposed of in the trash dumpster.
< Hazardous samples are returned to the supplier or sent to U.S. Pollution Control Incorporated (USPCI).

Quality Assurance Section

Sampling, Transporting and Identifying Concrete Samples

Sampling

< Cylinders are cast when membrane is cast, and are left in storage boxes in the field for twenty-four hours, (or up to no more than 48 hours) before transporting.

< The Field Material Technician records in field books air content, slump, and temperature of fresh concrete samples.

Transporting

< Within twenty-four to forty-eight hours, Materials Technicians transport cylinders from the field to the lab in containers padded with Styrofoam or sawdust. The Materials Technician is responsible for the transport system.

Identifying

< At the Central Materials Lab, the Materials Technician logs in each sample and assigns consecutive identification numbers. The Materials Technician is responsible for the numbering system. (Example of sample number: CD 100397 001. CD represents the manufacturer ID, 100397 represents the cast date, and 001 represents the number of pieces represented by the sample.)

< On break date, a lab technician will break and complete necessary reports for recording, and a lab supervisor checks these results.

Processing Concrete Samples

< After a set of test specimens is fabricated, the field data sheet is placed in the project field book which is placed in the project file.

< After compression tests are completed, the dimension and load is calculated and applied to Report Form R-251, and signed by the Lab Manager. Form R-251 indicates sample information for sample, project identification, cement information, and concrete mix results.

Recording Test Results

< The Physical Testing Lab Materials Technician records the results from the field book to the Standard Laboratory Compressive Strength Report for each set of three cylinders, and is responsible for the recording system.

< Compressive strength tests are performed on sets of three cylinders. (28 days ± 20 hours). The average of the three tests is the result which the Lab Materials Technician records in the Standard Laboratory Compressive Strength Report.

Concrete specimens are stored in the moist room during the entire established curing period. The specimens are disposed of when testing is completed.

Test Records and Forms

Asphalt Labs

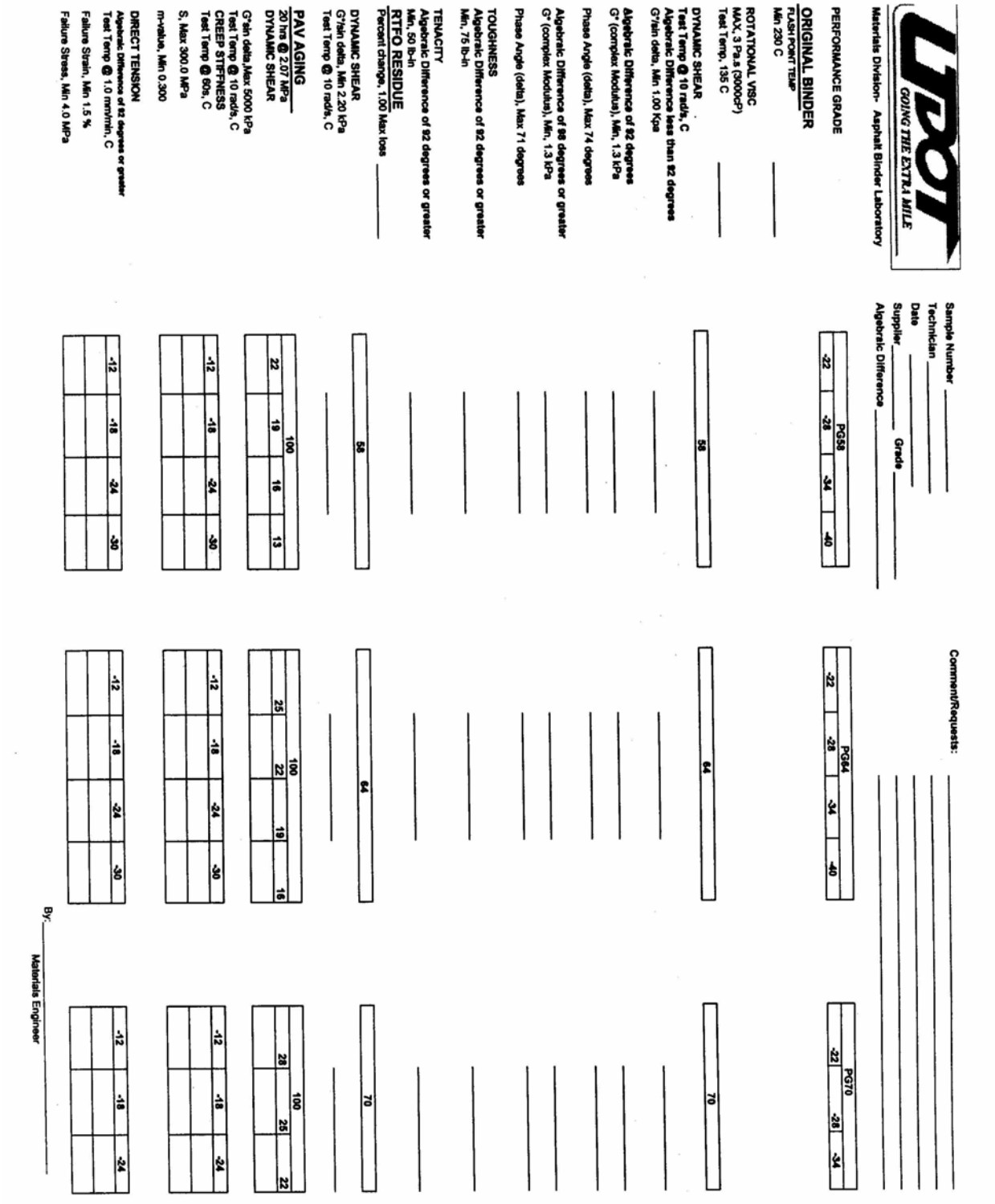
Preparing Sample Log
Each sample brought to the Asphalt Laboratory is recorded in a log book maintained by the Laboratory Engineer. The following is recorded for each sample:

< Sample number
< Project name and number
< Description of material
< Supplier of the material
< Name of Project Engineer responsible for sampling and submittal of the material
< Date of sampling
< Date the sample was received by the Asphalt/Chemistry Lab
< The word "BACK-UP SAMPLE" in red ink (when applicable)
< The date testing was completed (on permanent daily work sheet-source document)
< Condition of sample is noted on the report form
< The initials of the tester (on permanent daily work sheet-source document)

Preparing and Checking Test Reports
< Test results are recorded on standard asphalt laboratory worksheets which are kept permanently in 3-ring note binders.
< Information from these sheets is recorded daily in the log books and is reviewed daily by the laboratory engineer.
< Formal test reports are only prepared on sample failures.
< The original test report is kept in a project folder and a copy is faxed to the project engineer for review and assessment of price reductions to the contractor.

Amending Reports
When a report must be amended
< A report form is completed indicating the amended test results.
< The report status field "amended" on the report form is checked.
< The reason for the amended report is stated in the comment section.
< The amended report is attached to the original report and processed in the normal manner.
< The amended report is filed with the original report.

Asphalt Labs



Utah Department of Transportation
Sample Records and Reports
AASHTO and WTCG

T 228-94	T 44-94
sample ____ sample _____ sample _____ _________ _________ _________ _________ _________ _________	Sample wt. _________ before wt. of crucible _________ after wt. of crucible _________ Soluble in a percent _________ Soluble, percent = (a/bx100 A = total mass insoluble,and B = total mass of sample.

T 228-94	T 44-94
sample ____ sample _____ sample _____ _________ _________ _________ _________ _________ _________	Sample wt. _________ before wt. of crucible _________ after wt. of crucible _________ Soluble in a percent _________ Soluble, percent = (a/bx100 A = total mass insoluble,and B = total mass of sample.

T 228-94	T 44-94
sample ____ sample _____ sample _____ _________ _________ _________ _________ _________ _________	Sample wt. _________ before wt. of crucible _________ after wt. of crucible _________ Soluble in a percent _________ Soluble, percent = (a/bx100 A = total mass insoluble,and B = total mass of sample.

T 228-94	T 44-94
sample ____ sample _____ sample _____ _________ _________ _________ _________ _________ _________	Sample wt. _________ before wt. of crucible _________ after wt. of crucible _________ Soluble in a percent _________ Soluble, percent = (a/bx100 A = total mass insoluble,and B = total mass of sample.

Bituminous Lab
Test Records

Preparing Sample Log:
Each sample bought into the Bituminous laboratory is recorded on log sheet #R-247 and maintained by the laboratory supervisor. The following is recorded for each sample:

- Date
- Name and Number of Project
- Number of Samples
- Submitted By
- Initials of tester (on permanent report form)
- Condition of sampled noted on the report form

Preparing and Checking Test Reports:

1. Test results are recorded on standard Bituminous laboratory testing report forms.
2. The laboratory supervisor reviews the information on the testing report forms when testing is completed.
3. Formal test report forms are prepared for all completed testing and initialed by the laboratory supervisor.
4. Copies of formal test reports are mailed to the project engineer.
5. The original report forms are kept permanently in the project file cabinets.

Amending Reports
When a report must be amended

- A report form is completed indicating the amended test results.
- The report status field "amended" on the report form is checked.
- The reason for the amended report is stated in the comment section.
- The amended report is attached to the original report and processed in the normal manner.
- The amended report is filed with the original report.

Bituminous Lab

UTAH DEPARTMENT OF TRANSPORTATION
Grading Sheet

Name of Project: Cox Aggregate _____ **Project No.** _____

Lab No. TLA Study _____ **Sampled** _____ **20** _____ **Received at Lab** _____ _____

Station _____ **Relation to ℄** _____

Types of Material _____ **Plant** _____

Test for: _____ **Grading** _____ **Other** _____

		Grams	% Retained	% passing	Spec's
	1 -1/2				
	1				
	3/4				
	1/2				
	3/8				
	4				
	8				
Before Washing (Dry Weight) _____	16				
	30				
After Washing (-) _____	50				
200 Washed _____	100				
200 Sieved Out (+) _____	200				
Total - 200 _____	-200				
	Total Wt.		100		

Tested By _____ **Recp.** _____

Utah Department of Transportation
Construction/Materials Division
RUT TEST REPORT

Date Sampled:
Date Reported: 5/15/03

Project Name:
Project Number: Job Number:
Submitted By: Lab Number:
Project Engineer:

Mix From Roadway 9 BSC From Roadway 9 Mixed in Lab 9
Rice From Field 9 Rice From Lab

Mix Type: Pavement Age:
Asphalt Grade: No. Cycles:
Lane or Wheel Path: No. Beams Tested:
Lift/Layer:

Test No.	% Air Voids	% Density of Rice	Plastic Flow (mm)	Plastic Flow (in)	Pass/Fail
1		100		0.00	PASS
2		100		0.00	PASS
3		100		0.00	PASS
		AVERAGE	0.00	0.00	PASS

(Samples with a Plastic Flow > 5.0 are considered a Failure)

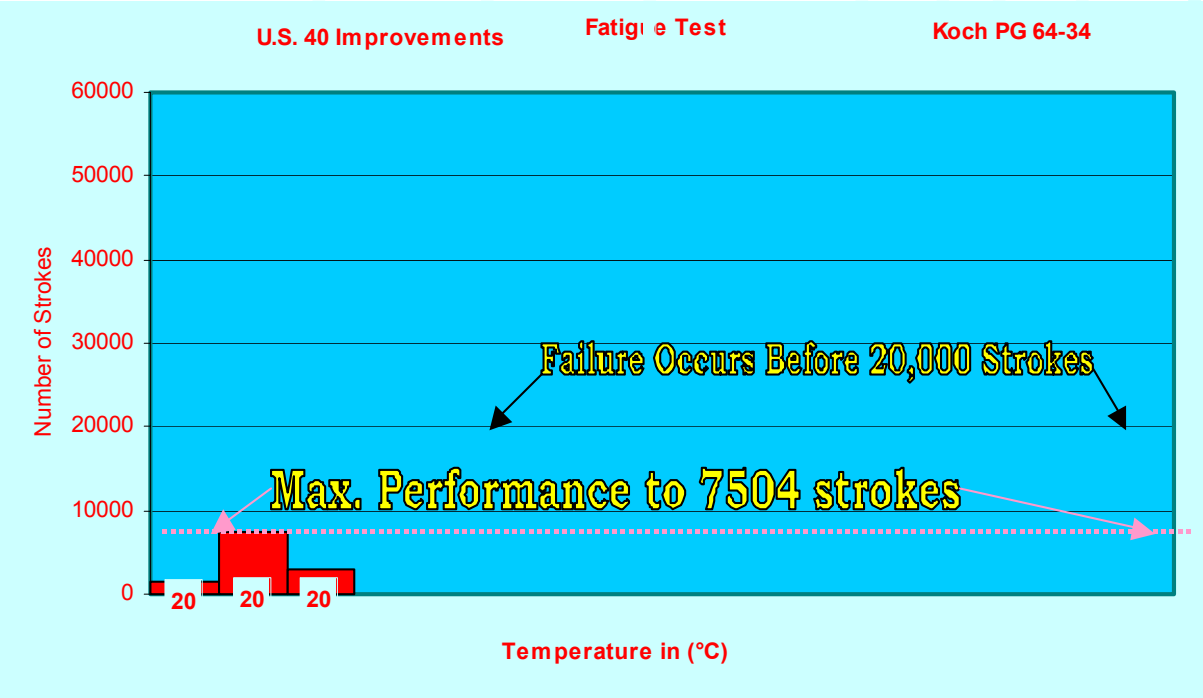
Comments:
Condition of Sample:

CC:

Materials Assistant Engineer

Fatigue Test

Beam Description	Strokes	Temp. (E°C)
US-40 Improvements	1560	20
US-40 Improvements	7504	20
US-40 Improvements	3048	20



Utah Department of Transportation

Materials Division

Bituminous Lab

Date: 02/11

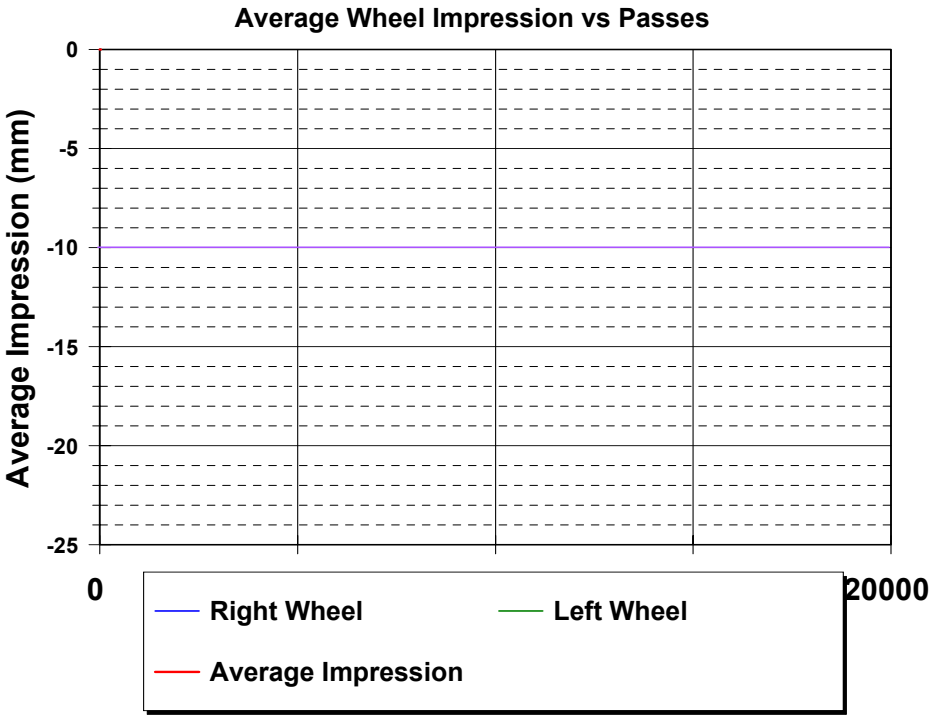
Date Sampled:

Lab Number:

	REGRESSIONS			
	Creep	Strip	Inflection	Max Imp.
0° C				
Average	0	0	0	ERR
Left	0	0	0	ERR
Right	0	0	0	ERR

Creep	Lt 1000 - 8000	Rt 1000 - 20000
Strip	Lt 10000 - 20000	Rt 0 - 0

Hamburg Wheel Impression



CONSTRUCTION AND MATERIALS DIVISION BITUMINOUS LAB.
AASHTO T-312-01
Gyratory Densification Worksheet

Project Engineer:
Project Name:
Project Number:
Job Number:
Aggregate Source:
Binder Type:

Lab Number:
Date Reported: 02/11
Date Sampled:

Design Data

ESALS (millions) =	Binder % =
High Pavement Temp. °C =	Ninitial =
Latitude =	Ndesign =
High Air Temp. °C =	Nmaximum =

Maximum Theoretical Specific Gravity
AASHTO T-209

Cali. Wt./Vessle (g)		Cali. Wt./Vessle (g)		
Wt. in Air (g)		Wt. in Air (g)		
Vessle Wt.+Water+Mix (g)		Vessle Wt.+Water+Mix (g)		
Volume/Voidless Mix	0.0	Volume/Voidless Mix	0.0	
Gmm	ERR	Gmm	ERR	Avg. Gmr ERR

Bulk Specific Gravity of Compacted Specimens
AASHTO T-166

Densification @ 0.00 % Binder

Specimen #	13	14
Wt. in Air (g)		
Wt. in Water (g)		
SSD Wt. in Air (g)		
Volume (cm^3)	0.0	0.0
Gmb Nmax.	ERR	ERR
Gmm	ERR	ERR
%Gmm Nmax.	ERR	ERR
% Air voids Nma	ERR	ERR

Stockpiles
Bulk Sp Grav of Combined Aggregate

	%	spg
		2.5990
2		2.5760
3		2.4540
4		2.533
5		2.553
6		2.439
7		0.000
8		0.000
9		0.000
10		0.000
	0.0	
	ERR	

Dust to Asphalt Rat

-.075um	
Sp Gr Oil	
%Agg con.	100.000
eff sp gr Agg	
Bulk sp gr	ERR
% AC	4.300
Ratio	

Densification Data @ 0.00 % Binder

Specimen #	13				Specimen #	14				Avg.	
Mass =	0.0 g				Mass =	0.0 g					
Gyration	Ht. mm	Gmb(est	Gmb(cor	%Gmm	Gyratior	Ht. mm	Gmb(est	Gmb(corr)	%Gmm	%Gmm	Specs.
0	ERR	ERR	ERR	Ninitial	0	2.027	ERR	ERR	ERR	ERR	<90.5
0	ERR	ERR	ERR	Ndesign	0	ERR	ERR	ERR	ERR	ERR	= 96%
0	ERR	ERR	ERR	Nmaximum	0	ERR	ERR	ERR	ERR	ERR	<98%
Gmb(meas)	ERR				Gmb(meas)	ERR					

Properties

Specimen #	13	14	Avg.	Spec.
% Air Voids Nde	ERR	ERR	ERR	4.00
% VMA Ndes	ERR	ERR	ERR	>14
% VFA Ndes	ERR	ERR	ERR	+65-75

Comments:

CC:

Materials Assistant Engineer

UTAH DEPARTMENT OF TRANSPORTATION
ASPHALT ANALYSIS AND GRADING SHEET

Project Name: Lab. No.
Project No.: Auth. No. Smp Date:
Station:
Material Type: Report Date:
Test for:
Plant: TEMP.
TIME:

VACUUM EXTRACTION PROCESS

Bituminous Mix Mass			0.0
Filter Mass			0.0
Total Mass			0.0
Extracted Mass	Agg. Mass 0	Fltr. Mass 0	0.0
A.C. Mass			0.0
B.W.			0.0
Percent A.C.			ERR
Retention Factor			0.00

ADJUSTED PERCENT A.C. ERR

Moisture Extraction Data

% Moisture

		Metric	American	Mass	% Ret.	% Pass	Rept. Pass.
		37.5 mm	1 1/2			ERR	ERR
		25.4 mm	1			ERR	ERR
		19.0 mm	3/4			ERR	ERR
6.35 mm	4.75 mm	12.5 mm	1/2			ERR	ERR
1/4"	#4	9.5 mm	3/8			ERR	ERR
0.0	0.0	4.75 mm	# 4			ERR	ERR
		2.36 mm	# 8			ERR	ERR
		1.18 mm	# 16			ERR	ERR
B.W.	0.0	600µm	# 30			ERR	ERR
A.W.	0.0	300µm	# 50			ERR	ERR
-75µm W.	0.0	150µm	# 100			ERR	ERR
-75µm S.	0.0	75µm	# 200			ERR	ERR
Total	0.0	-75µm	-200				
		Total Wt.					

Recp. ERR

Tested By:

REGION II MATERIALS ENGINEER

Cement Lab

Preparing Sample Log:

Each sample bought into the Cement laboratory is recorded on a log sheet and maintained by the laboratory supervisor. The following is recorded for each sample:

- Date
- Name and Number of Project
- Number of Samples
- Submitted By
- Initials of tester (on permanent report form)
- Condition of sampled noted on the report form

Preparing and Checking Test Reports:

1. Test results are recorded on standard laboratory testing report forms.
2. The laboratory supervisor reviews the information on the testing report forms when testing is completed.
3. Formal test report forms are prepared for all completed testing and initialed by the laboratory supervisor.
4. Copies of formal test reports are mailed to the project engineer.
5. The original report forms are kept permanently in the project file cabinets.

Amending Reports

When a report must be amended:

- A report form is completed indicating the amended test results.
- The report status field "amended" on the report form is checked.
- The reason for the amended report is stated in the comment section.
- The amended report is attached to the original report and processed in the normal manner.
- The amended report is filed with the original report.

Cement Lab

Utah Department for Transportation
Central Materials Testing Lab
Cement Test Report

Project Name
Project Number | Project Engineer
Authority No. | Plant Name

Specification for Portland Cement ASTM C-150

Sample or Lab #		97-7-C (Lab No.	Last 4 Digits)
Date Sampled			
Date Receive in lab			
Date(s) testing completed			
Type			
Silicon Dioxide (Si02)		%	
Aluminum Oxide (Al2O3)		%	
Ferric Oxide (Fe2O3)		%	
Calcium Oxide (CaO)		%	
Magnesium Oxide (MgO)		%	
Sulphur Trioxide (SO3)		%	
Loss on Ignition		%	
Sodium Oxide (Na2O)		%	
Potassium Oxide (K2O)		%	
Insoluble Residue		%	
Total Alkali		%	
Tricalcium Silicate (C3S)		%	
Dicalcium Silicate (C2S)		%	
Tricalcium Aluminate (C3A)		%	
Fineness, Blaine			
Air			
Autoclave			
3 Day Compressive Strength			
7 day Compressive Strength			
VICAT, Initial Set			
VICAT, Final Set			
Comments			
Condition of Sample			
Sara Carlock - Chemist			

Chemistry Lab

Preparing Sample Log

Each sample brought to the Chemistry Laboratory is recorded in a log book maintained by the Chemist. The following is recorded for each sample:

< Sample number
< Project number
< Description of material - condition of material noted on report form
< Analysis required
< Date the sample was received by the Chemistry Lab
< Date the sample was completed

Preparing and Checking Test Reports

< Test results are recorded on standard chemistry laboratory worksheets which are kept permanently in 3-ring note binders.
< Information from the worksheets is recorded in a log book kept in the chemistry office.
< Formal test reports are prepared for samples from outside of UDOT.
< Informal test reports are prepared from the worksheets and submitted to the requesting personnel. A copy of each report is kept in a file in the chemistry office.

Amending Reports

When a report must be amended:

< A report form is completed indicating the amended test results.
< The report status field “amended” on the report form is checked.
< The reason for the amendment is written in the comment section of the amended report.
< The amended report is attached to the original report and processed in the normal manner.
< The amended report is filed with the original report.

Chemistry lab

Form R-256

Utah Department of Transportation

Materials and Research Section

Test Report

Project Name _____ Project No. _____

Date Sampled _____ Authority No. _____

Submitted By _____ For Project Engineer _____

Laboratory No: _____ Identification Marks: _____

Name of Material: _____ Quanitity Represented: _____

Source of Material _____ Location: _____

Condition of Sample: _____

Date Received: _____

Dated Tested: _____ Examined for: State of Utah Specifications

Test results

Sample Number	*Sample Description*	*Parameter*	*Result*

The material ["meets" or "does not meet"] State of Utah Specificiation for Highway construction.

by _____

ChemR256.wb2 Chemist

Geotechnical Division
Geotechnical Lab

Preparing Sample Log

Each sample brought into the geotechnical laboratory is recorded on the log sheet maintained by the laboratory engineer. The following is recorded for each sample:

< Date
< Name and Number of Project
< Name of Structure or Study
< Number of samples (Bottles, Tubes, Cores)
< Brought in by
< Condition of sample noted on the report form
< Initials of tester (on permanent report form)

Preparing and Checking Test Reports:

1. Test results are recorded on standard geotechnical laboratory testing report forms.
2. The laboratory supervisor reviews the information on the testing report forms when testing is completed.
3. Formal test report forms are prepared for all completed testing and initialed by the laboratory supervisor.
4. Copies of formal test reports are mailed to the project geotechnical engineer.
5. The original report forms are kept permanently in the project file cabinets.

Amending Reports

When a report must be amended:

< A report form is completed indicating the amended test results.
< The report status field "amended" on the report form is checked.
< The reason for the amended report is stated in the comment section.
< The amended report is attached to the original report and processed in the normal manner.
< The amended report is filed with the original report.

Geotechnical Division
Aggregate Lab

Preparing Sample Log

Each sample brought into the aggregate laboratory is recorded on the log sheet maintained by the laboratory engineer. The following is recorded for each sample:

< Date Received
< Name and Number of Project
< Sample Number
< Material Description - condition of sample noted in comments
< Supplier
< Project Engineer
< Date of Sampling
< Initials of tester(on permanent report form)

Preparing and Checking Test Reports:

1. Test results are recorded on standard geotechnical laboratory testing report forms.
2. The laboratory supervisor reviews the information on the testing report forms when testing is completed.
3. Formal test report forms are prepared for all completed testing and initialed by the laboratory supervisor.
4. Copies of formal test reports are mailed to the project geotechnical engineer.
5. The original report forms are kept permanently in the project file cabinets.

Amending Reports

When a report must be amended:

< A report form is completed indicating the amended test results.
< The report status field "amended" on the report form is checked.
< The reason for the amended report is stated in the comment section.
< The amended report is attached to the original report and processed in the normal manner.
< The amended report is filed with the original report.

Geotechnical Section

Utah Department Of Transportation
Geotechnical Laboratory
Consolidation (T-216)

Project Number _____ Consolidation Machine Number _____
Project Name _____ Date Test Started _____
Location _____ Engineer _____
Boring Number _____ Technician _____
Depth _____
Sample Type _____
Sample Description _____
Remarks _____ Saturation Load _____

Seating Load Pressure 0.05 TSF or 0.69 PSI

Applied Pressure TSF	Applied Pressure PSI	Gage Pressure PSF
0.1	1.39	200
0.2	2.78	400
0.4	5.56	800
0.8	11.11	1600
1.6	22.22	3200
3.2	44.44	6400
6.4	88.89	12800
12.8	177.78	25600
25.6	355.56	51200
51.2	711.11	102400
12.8	177.78	25600
3.2	44.44	6400
0.8	11.11	1600
0.2	2.78	400

Moisture Content

Before Test		After test	
Container ID	_____	Container ID	_____
Container Weight	_____	Container Weight	_____
Wet Soil & Container	_____	Wet Soil & Container	_____
Dry Soil & Container	_____	Dry Soil & Container	_____
		Weight Of Ring	_____
Wet Soil & Ring	_____	Wet Soil & Ring	_____

Test Constants

Liquid Limit	_____	Initial Void Ratio	_____
Plastic Limit	_____	Wet Unit Weight	_____
Specific Gravity	_____	Dry Unit Weight	_____
Initial Diameter	_____		
Initial Height	_____		
Weight Of Piston & Top Cap	_____		

UTAH STATE DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATORY
Direct Shear Test (T-236)

Project Name _____
Project No. _____
Soil Description _____
Moisture % ERR
Unit Wt. wet 0 pcf
Unit Wt dry ERR pcf

Calibration factor = 0.01578

Drill Hole No. _____
Depth (ft) _____
Test No. _____
Normal load _____ tsf
Press Gauge _____ lbs.

cohesion _____ tsf
tested by: M. Graham friction angle _____ degrees Date: _____

container no.	wt. cont. + wet soil (grams)	wt. cont. + dry soil (grams)	wt. water (grams)	wt cont. (grams)	wt. dry soil (grams)	water con. before test	water con. after test
			0		0	ERR	
			0		0		ERR

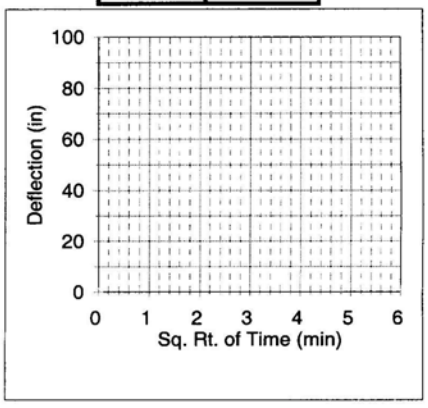
wt of ring & sample ..... _____ grams
wt of ring _____ grams
wt of sample 0 grams

*time to failure = 12*t90* *Strain Rate = 0.24"/time to failure*

Shear Disp. (inches)	Shear Force (lbs)	Vert. Disp. (inches)	Horiz. Resis. (tsf)
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0

Consolidation

Time	Vert. Gage (inches)
0 sec	0
6 sec	
10 sec	
20 sec	
50 sec	
100 sec	
200 sec	
500 sec	
1000 sec	
2000 sec	
4000 sec	
8000 sec	
16000 sec	
32000 sec	



UTAH DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATORY
MOISTURE-DENSITY RELATIONSHIPS (T-99 T-180)

PROJECT NO:	DATE:	PIN NO:
PROJ. NAME:	ENGINEER:	CID:
	TECHNICIAN:	

SAMPLE:	MOLD VOL: 0.0332192 (ft^3)	MOLD WT: 4217.5 (g)

TEST NO.	1	2	3	4	5	6	7	8
WATER ADDED (ml)								
MOLD & WET SOIL (g)								
WET DENSITY (pcf)								
DISH NO								
DISH (g)								
WET SOIL & DISH (g)								
DRY SOIL & DISH (g)								
% MOISTURE								
DRY DENSITY (pcf)								

SAMPLE:	MOLD VOL: (ft^3)	MOLD WT: (g)

TEST NO.	1	2	3	4	5	6	7	8
WATER ADDED (ml)								
MOLD & WET SOIL (g)								
WET DENSITY (pcf)								
DISH NO								
DISH (g)								
WET SOIL & DISH (g)								
DRY SOIL & DISH (g)								
% MOISTURE								
DRY DENSITY (pcf)								

SAMPLE:	MOLD VOL: (ft^3)	MOLD WT: (g)

TEST NO.	1	2	3	4	5	6	7	8
WATER ADDED (ml)								
MOLD & WET SOIL (g)								
WET DENSITY (pcf)								
DISH NO								
DISH (g)								
WET SOIL & DISH (g)								
DRY SOIL & DISH (g)								
% MOISTURE								
DRY DENSITY (pcf)								

COMMENTS:

UTAH DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATY
PARTICAL SIZE ANALYSIS OF SOILS (T-88)

ɾr number: 2364 Date: _____
me: _____
mber: _____ File #: _____

Elap time min.	Temp. C	Hydro. reading	Hyd. Correc.	Cor. Hyd. Reading	% P Finer (<#10)	Sqrt(L/T)	K	Particle Diam.(mm)
1				0	ERR	4.0373	ERR	ERR
2				0	ERR	2.8548	ERR	ERR
5				0	ERR	1.8055	ERR	ERR
15				0	ERR	1.0424	ERR	ERR
30				0	ERR	0.7371	ERR	ERR
60				0	ERR	0.5212	ERR	ERR
120				0	ERR	0.3686	ERR	ERR
250				0	ERR	0.2553	ERR	ERR
1440				0	ERR	0.1064	ERR	ERR

Specific Gravity: _____

	% Finer
% of sample passing #10:	ERR
0.020	ERR
0.002	ERR
0.001	ERR

Ɛ SIZE DISTRIBUTION

wt. retain.	(% Pass.)
	ERR
	ERR
	ERR
	ERR
	ERR
ERR	
ERR	

Hygroscopic Moisture Content

Weight of Wet Soil + Container: _____ grams
Weight of Dry Soil + Container: _____ grams
Weight of Container: _____ grams
%Moisture: ERR

Total Air Dried Sample Weight: _____ grams

Total "Oven Dry" Sample Weight: ERR grams

MGraham

Materials Engineer: DSjoblom

UTAH DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATORY
SOIL CLASSIFICATION (T-87 T-89 T-90 T-265)

PROJECT NO: DATE: FILE NO:

PROJECT NAME: ENGINEER: CID:

SAMPLE: TECHNICIAN:

Sieve Analysis			
screen size	weight retained	% retained	total % passing
3"		ERR	ERR
2"		ERR	ERR
1.5"		ERR	ERR
1"		ERR	ERR
3/4"		ERR	ERR
No. 4		ERR	ERR
No. -4		ERR	ERR
No. 10		ERR	ERR
No. 40		ERR	ERR
No. 200		ERR	ERR
No. -200		ERR	ERR
Wash			

Moisture				
can No.	can	wet soil + can	dry soil + can	dry weight	% moisture
					ERR

Liquid Limit				
taps	wet	dry	can	% water	L.L.

Ave L.L. N.A.

Plastic Limit		
wet	dry	can	P.L.
			N.P.

P.I. N.P.

Soil Classification		
AASHTO	USCS	
ERR	ERR	ERR

% Gravel	ERR
% Sand	ERR
% Fines	ERR

COMMENTS:

UTAH DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATORY
SPECIFIC GRAVITY OF SOILS (T-100)

PROJECT NO:	DATE:	PIN NO:
PROJ. NAME:	ENGINEER:	CID:
SAMPLE NO:	TECHNICIAN:	PYC. NO:

1. WEIGHT OF PYCNOMETER NO 0: _____ g

2. WEIGHT OF PYCNOMETER AND DRY SAMPLE: _____ g

3. WEIGHT OF PYCNOMETER FILLED WITH WATER: _____ g

4. WEIGHT OF PYCNOMETER FILLED WITH WATER AND SOIL: _____ g

5. TEMPERATURE OF WATER AND SAMPLE IN PYCNOMETER: _____ C

6. K VALUE FOR TEMPERATURE OF WATER AND SAMPLE: _____

A. SPECIFIC GRAVITY AT 0.0 DEG. CELCIUS: _____

B. SPECIFIC GRAVITY AT 20 DEG. CELCIUS: _____

COMMENTS: _____

_____

O:\Geotech Lab\WORKSHTS\Unconfinedworksheetnew.wb2

UTAH DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL LABORATORY
UNCONFINED COMPRESSION TEST (T-208)

PROJECT NO:	DATE:	PIN NO:
PROJ. NAME:	ENGINEER:	CID:
SAMPLE NO:	TECHNICIAN: M. Graham	

INITIAL DIMIENSION (in)	
DIAMETER	
LENGTH	
AREA	0.000

	CAN NO.	WT CAN g	WET + CAN g	DRY + CAN g	MOISTURE %
BEFORE					

TIME min.	AXIAL LOAD lbs	LENGTH CHANGE in	STRAIN e %	1 - e %	AREA in^2	AXIAL LOAD lbs	STRENGTH, qu psf
0.0		0.000					
0.5		0.025					
1.0		0.050					
1.5		0.075					
2.0		0.100					
2.5		0.125					
3.0		0.150					
3.5		0.175					
4.0		0.200					
4.5		0.225					
5.0		0.250					
5.5		0.275					
6.0		0.300					
6.5		0.325					
7.0		0.350					
7.5		0.375					
8.0		0.400					
8.5		0.425					
9.0		0.450					
9.5		0.475					
10.0		0.500					
10.5		0.525					
11.0		0.550					
11.5		0.575					
12.0		0.600					
12.5		0.625					

Sample Wet Wt:	Wet Density: ERR	Dry Density: ERR

COMMENTS:

Paint Lab/Pavement Marking Lab

Preparing Sample Log

< Each sample received is recorded in a log book with the following information:
  - < Description of material, and condition of material is noted in comments
  - < Lot number
  - < Manufacturer name
  - < Date of testing
  - < Suppliers or Region sampled from
  - < Project name
  - < Name of technician conducting the test
  - < Test results
  - < Material “passes” or “fails”

Preparing and Checking Test Reports

< Test results are recorded on a standard test report form.
< Report forms are maintained in a materials file and a project file until project is closed.
< Passing material is recorded on a test report which is distributed to the project Engineer or Maintenance Engineer.
< Failing material is verbally reported to the Project engineer, Region Maintenance Engineer or Contractor.
< Reports contain all information in the sample log book including quantity used or represented.
< All testing conducted is charged to a construction project or maintenance charge ID.

Amending Reports

When a report must be amended:

< A report form is completed indicating the amended test results.
< The report status field "amended" on the report form is checked.
< The reason for the amended report is stated in the comment section.
< The amended report is attached to the original report and processed in the normal manner.
< The amended report is filed with the original report.

Quality Assurance Section
Test Records

Preparing Sample Log

Each sample brought into the laboratory is recorded on log sheet #R-251 and maintained by the laboratory supervisor. The following is recorded for each sample:

< Name and Number of Project
< Number of Samples
< Submitted By
< Condition of sample noted in comments
< Material Nomenclature

Preparing and Checking Test Reports:

1. Test results are recorded on Report Form R-251.
2. The laboratory supervisor reviews the information on the testing report forms when testing is completed.
3. Report Form R-251 is prepared for all completed testing and initialed by the laboratory supervisor.
4. Copies of test report forms are mailed to the project engineer.
5. The original report forms are kept permanently in the project file cabinets.

Amending Reports

When a report must be amended:

< A report form is completed indicating the amended test results.
< The report status field "amended" on the report form is checked.
< The reason for the amended report is stated in the comment section.
< The amended report is attached to the original report and processed in the normal manner.
< The amended report is filed with the original report.

Record Retention and Reference Manuals

Record Retention

All Materials Laboratory records relating to the Quality System Manual are retained for at least three years. Each individual lab maintains a file of records for that period of time.

Reference Manuals Used in Labs

Annual Books of ASTM Standards
AASHTO Materials Specifications and Tests
UDOT Manual of Instruction, Part 8 - Materials

Reference Manuals Used in the Chemistry Lab

Annual Books of ASTM Standards
Standard Methods of Chemical Analysis - F. J. Welcher, Editor
CRC Handbook of Chemistry and Physics
AASTHO Standards

Certification Lab QSM Documents

Equipment Inventory, Traceability Certifications and Calibration Sheet for the following:

- Four sets of test weights (2 set class B, 1 set class S-1, 1 set in english units)
- Load cells
- Linear measuring devices (3 micrometers and 1 caliper)
- Transducers
- 3 Thermometers
- Optical sieve inspection device

Copy of QSM must be in lab at all times.